Assignment 8

Textbook Assignment: Chapters 10 (117-119), 11, 12

8-1. What is the quotient when

$$\frac{p^2 - p - 12}{10p^2 + 3pq - q^2}$$

is divided by

$$\frac{p^2 - 2p - 8}{5p^2 + 4pq - q^2} ?$$

1. $\dfrac{(p + 3)(p + q)}{(2p + q)(p + 2)}$

2. $\dfrac{(p + 3)(p - q)}{(2p + q)(p + 2)}$

3. $\dfrac{(p + 3)(p + q)}{(p + q)(2p + 2)}$

4. $\dfrac{(p + 3)(2p + q)}{(p + q)(2p + 2)}$

8-2. What is the sum of the fractions

$$\frac{m + 5}{2m^2 + 5m - 3}$$

and

$$\frac{2m - 11}{2m^2 + 13m - 7} ?$$

1. $\dfrac{(3m + 1)(m + 2)}{(2m + 1)(m + 3)(m + 7)}$

2. $\dfrac{(3m + 1)(m + 2)}{(2m - 1)(m + 3)(m + 7)}$

3. $\dfrac{(3m - 1)(m - 2)}{(2m - 1)(m - 3)(m - 7)}$

4. $\dfrac{(3m - 1)(m + 2)}{(2m + 1)(m + 3)(m - 7)}$

8-3. What is the remainder when

$$\frac{2a - 3}{a^2 + 5a - 14}$$

is subtracted from

$$\frac{2a - 5}{a^2 + 4a - 12} ?$$

1. $\dfrac{-17}{(a + 6)(a + 7)(a - 2)}$

2. $\dfrac{-17}{(a + 6)(a - 7)(a + 2)}$

3. $\dfrac{-17}{(a - 6)(a + 7)(a + 2)}$

4. $\dfrac{-17}{(a - 6)(a - 7)(a - 2)}$

8-4. What is the least common denominator of the fractions

$$\frac{7}{a + 3}, \quad \frac{a - 9}{a^2 - 2a - 15}, \quad \text{and} \quad \frac{a^2 - 16}{a^2 - 4a - 5}?$$

1. $a^2 + 4a + 3$
2. $a^2 - 4a - 5$
3. $a^3 - a^2 - 17a - 15$
4. $a^3 - 9a^2 + 15a + 25$

8-5. An equation is an expression of equality.

8-6. What is the fixed constant in the equation $bx + 4y = c$?
1. b
2. c
3. y
4. 4

8-7. Which of the following letters normally represents an arbitrary constant?
1. a
2. x
3. y
4. w

8-8. How many variable terms are in the equation

$$2x + 3y + 5 = -z \quad ?$$

1. Four
2. Three
3. Two
4. One

8-9. For how many values of x does $2x - 7 = 18$?
1. One
2. Two
3. Three
4. Indefinite number

S-10. What is the degree of the equation

$$3x - x(2 + y) = y?$$

[Hint: Simplify the equation first by performing the indicated multiplication.]
1. First
2. Second
3. Third
4. Fourth

8-11. The equation which is first degree in the variables x and y is called a linear equation because its graph is a straight line.

8-12. Which of the following expressions is an identity?
1. $2x - 7 = 0$
2. $9a = 2a - 5$
3. $a(a + b) = a^2 - ab$
4. $c(10 - b) = -bc + 10c$

8-13. An identity is true for one value of the variable whereas a conditional equation is true for many values of the variable.

8-14. A conditional equation reduces to an identity when the variable is replaced by
1. the arbitrary constant in the equation
2. the fixed constant in the equation
3. an arbitrary numerical value
4. a root of the equation

8-15. In solving a linear equation by manipulating both sides of the equation, division by zero is not permitted.

8-16. What is the value of x in the equation $x + 1 = 1$?
1. 0
2. 1
3. 2
4. Not solvable

8-17. What is the value of y in the equation

$$\frac{y}{7} = 6?$$

1. $\frac{6}{7}$ 3. 7

2. 6   4. 42

8-18. What is the value of x in the equation

$$7x = 19?$$

1. 2.6   3. $\frac{7}{19}$

2. 2.9   4. $\frac{19}{7}$

8-19. What is the value of x in the equation

$$\frac{x}{7} + 12 = 15?$$

1. 7
2. 14
3. 21
4. 28

8-20. The equation $8x - 3 = 37$ can be solved by
1. dividing both members by 8 and then adding 3 to both members
2. adding 3 to both members and then dividing both members by 8
3. subtracting 3 from both members and then dividing both members by 8
4. subtracting 37 from both members and then dividing both members by 8

8-21. What is the value of x in the equation

$$x - 4 = 2x - 8?$$

1. $-\frac{4}{3}$

2. -4

3. $\frac{4}{3}$

4. 4

8-22. To solve the equation

$$\frac{5z}{7} - 2z = 8z + 1,$$

you first multiply both members by 7.
What steps must you take next?
1. Add 9z to both members and divide both members by 7.
2. Subtract 19z from both members and divide both members by 75.
3. Subtract 56z from both members and divide both members by -65.
4. Subtract 19z from both members and divide both members by 37.

8-23. What is the value of x in the equation ax + b = 0?
1. a - b
2. b - a
3. $\frac{-b}{a}$
4. $\frac{-a}{b}$

8-24. Which of the following procedures can be used to solve the equation cy + 7 = 10 - dy for y?
1. Add dy to both members, factor out the coefficient of y, and then divide both members by c + d
2. Add dy to both members, factor out the coefficient of y, and then divide both members by c - d
3. Add dy -7 to both members, factor out the coefficient of y, and then divide both members by c + d
4. Add dy -7 to both members, factor out the coefficient of y, and then divide both members by c - d

8-25. What is the value of x in the equation

2x - [x - (3x + 7)] = 17 + 2(x + 4)?

1. -3
2. 2
3. 9
4. 15

8-26. What step must you take first when you solve the equation

$$\frac{8y}{9} = \frac{1}{2} - \frac{y}{12} ?$$

1. Divide both members by y.
2. Multiply both members by 12.
3. Multiply both members by 36.
4. Subtract $\frac{1}{2}$ from both members.

8-27. What is the numerical value of y in the equation

$$\frac{y}{2} + 4 = \frac{y}{3} ?$$

1. 12
2. 24
3. -12
4. -24

8-28. The general form, ax + b = 0, does not represent 7x - [4 - (6 + x)] = 4.

8-29. What are the values of the constants a and b when the equation

9 - (2 - 8x) = 14x + 12

is simplified and put into the general form ax + b = 0?
1. a = 10, b = -13
2. a = 12, b = 7
3. a = -8, b = 12
4. a = -6, b = -5

8-30. Assume that two resistors connected in parallel have a resistance of 240 ohms. The markings on R_1 indicate that it has a resistance of 400 ohms. Overheating has burned off the marking of R_2. The total resistance of two resistors connected in parallel is given by the formula

$$\frac{1}{R_t} = \frac{1}{R_1} + \frac{1}{R_2}.$$

What is the resistance of R_2?
1. 600 ohms
2. 800 ohms
3. 1,000 ohms
4. 1,200 ohms

8-31. Which equation expresses the following statement? Three numbers are such that the second is twice the first and the third is seven less than three times the second and the sum of the three is 38.
1. 9x = 63
2. x + 2x + 6x = 31
3. x + 2x + 3(2x - 7) = 38
4. x + 2x + (6x - 7) = 38

8-32. The inequation x + 7 > 15 has
1. a finite number of solutions
2. a solution of x = 8
3. a solution set
4. one solution

8-33. The two inequalities 5 > 3 and 3 < 5 have the same sense.

8-34. If the same negative number is added to both sides of an inequation, the sense of the inequation is reversed.

8-35. How may the value of x be identified in the inequation x + 4 < - 7?
1. x > - 11
2. x < - 3
3. x < - 11
4. x < - 15

8-36. If both members of an inequation are multiplied by a positive number less than one, the sense of the inequation is reversed.

8-37. How may the value of x be identified in the inequation $4 - x > 8$?
1. $x > -4$
2. $x < -4$
3. $x < -12$
4. $x > -12$

8-38. If $x^2 > 9$, the solution set includes ±3.

8-39. In the Cartesian or rectangular coordinate system, the x and y axes intersect at an angle of
1. 0°
2. 45°
3. 60°
4. 90°

8-40. In writing the coordinates of a point in the Cartesian coordinate system, the y coordinate is always written second.

8-41. What are the coordinates of the origin point?
1. (1, 0)
2. (1, 1)
3. (0, 0)
4. (0, 1)

8-42. What are the coordinates of a point located 3 units below the x-axis and 7 units to the right of the y-axis in a Cartesian coordinate system?
1. Ordinate is 3, abscissa is 7.
2. Ordinate is -3, abscissa is 7.
3. Ordinate is 7, abscissa is -3.
4. Ordinate is -7, abscissa is -3.

8-43. Refer to figure 12-1 in your textbook. In a rectangular coordinate system, the point with coordinates (2, -1) is located in which quadrant?
1. First
2. Second
3. Third
4. Fourth

8-44. When the rectangular coordinates of a point are squared, numbers result that represent the rectangular coordinates of another point. The two points will be in the same quadrant only if the original point was in which quadrant?
1. First
2. Second
3. Third
4. Fourth

8-45. The quadrant in which both x and y are negative is the
1. first
2. second
3. third
4. fourth

8-46. The graph of $x - y = 4$ reveals that an infinite number of points satisfy the equation.

8-47. The x-coordinate of a point lying on the graph of the equation $3x + y = 2$ is 9. What is the y-coordinate of the point?
1. -21
2. -24
3. -25
4. -29

8-48. Which of the following pairs of coordinates are the coordinates of a point lying on the graph of the equation $3y - 2x = -1$?
1. (-5, 2)
2. (1, -3)
3. (8, 6)
4. (11, 7)

8-49. How many points do the graphs of the equations $6x - 3y = 7$ and $12x - 6y = 14$ have in common?
1. None
2. 1
3. 2
4. An infinite number

8-50. Assume that a line is drawn through the points with coordinates (-2, 10) and (5, -11). Which of the following equations is the equation of that line?
1. $x - 7 = -9$
2. $2x + 2y = 5$
3. $3x + y = 4$
4. $4x - 3y = 11$

8-51. Which of the following pairs of numbers is a solution of the equation $17x + 8y = -15$?
1. $x = \frac{1}{2}$, $y = -3$
2. $x = -1$, $y = \frac{1}{4}$
3. $x = \frac{1}{3}$, $y = -\frac{8}{3}$
4. $x = -3$, $y = \frac{9}{4}$

8-52. If both point A and point B satisfy both linear equation 1 and linear equation 2, then equation 1 and equation 2 represent the same straight line.

8-53. To find the y intercept of a linear equation, let $y = 0$.

8-54. Which of the following equations has a graph with an x intercept of 4 and a y intercept of 6?
1. $3x + 2y = 12$
2. $y - 2x = 4$
3. $2y - 3x = 6$
4. $6x + 4y = 2$

8-55. An equation that contains y as the only variable always has a graph that
1. passes through the origin
2. has an x intercept
3. lies parallel to the x-axis
4. lies parallel to the y-axis

8-56. What is the graph of the equation
$x = 0$?
1. The x-axis
2. The y-axis
3. A horizontal line above the x-axis
4. A vertical line to the right of the y-axis

8-57. If two linear equations are satisfied by the point (3, 4) and if this point is the only point satisfying both equations, then the two lines are parallel.

8-58. The graphical method of solving simultaneous equations is an exact method.

8-59. In solving a pair of simultaneous linear equations by the addition method, you must first
1. add the two equations
2. subtract one equation from the other
3. make the coefficients of both variables the same in both equations
4. make the coefficients of one of the variables the same, except for sign, in both equations

8-60. One way to eliminate x from the equations $3x + 2y = 6$ and $5x + 7y = 43$ when solving by means of the addition method is to
1. multiply the first equation by 5 and the second equation by -3
2. multiply the first equation by 3 and the second equation by 5
3. subtract the first equation from the second
4. subtract the second equation from the first

8-61. In eliminating y from the simultaneous equations
$$2x + 7y = 3$$
$$3x - 5y = 31$$
by the method of addition, the resulting equation is
1. $5x = 34$
2. $29x = 176$
3. $31x = 232$
4. $31x = 372$

8-62. The substitution method of solving simultaneous linear equations involves replacing one of the variables in one equation with
1. the variable's coefficient in the other equation
2. its value in terms of the other variable
3. the other equation
4. the constant from the other equation

8-63. In solving the system of equations,
$$2x - 3y = 4$$
$$x + 2y = 6$$
by the substitution method, which of the following is a correct substitution for a variable from one equation into the other?
1. $x = 2y + 6$
2. $x = 3y + 4$
3. $y = \dfrac{4 - 2x}{- 3}$
4. $y = \dfrac{3 - x}{2}$

8-64. After substituting for one variable in the method of substitution, the two original simultaneous equations are reduced to one equation in one variable.

8-65. Which of the following sets of expressions is a solution of the simultaneous equations
$$4x + y = a$$
$$3x + 2y = b?$$
1. $x = \dfrac{2a - b}{5}$, $y = \dfrac{4b - 3a}{5}$
2. $x = \dfrac{a - b}{5}$, $y = \dfrac{b - a}{5}$
3. $x = \dfrac{2a - 3b}{5}$, $y = \dfrac{3a - 4b}{5}$
4. $x = \dfrac{3a - 2b}{5}$, $y = \dfrac{4b - a}{5}$

8-66. A form of the first-degree equation in two variables is
1. $x^2 + py^2 = q$
2. $x + py^2 = q$
3. $x^2 + py = q$
4. $x + py = q$

8-67. Where do the graphs of a pair of simultaneous equations intersect if the constant term of each equation is zero?
1. On the positive x-axis
2. On the positive y-axis
3. At the origin
4. At infinity

8-68. Refer to figure 12-8 in your textbook which shows the graphs of two parallel linear equations. Which of the following statements concerning the nature of the two equations is true?
1. The equations contain an x term only.
2. The equations are identical except for the value of the constant term.
3. The equations have the same constant term.
4. The equations both have zero constant terms.

8-69. How many solutions does a pair of simultaneous equations in two variables have if the graphs of the equations are parallel?
1. None
2. 1
3. 2
4. An indefinite number

8-70. Which of the following sets of simultaneous equations cannot be solved?
1. $x - 2y = 0$ and $2x + 7 = 0$
2. $x + 3y = 4$ and $2x + 5y = 8$
3. $2x + y = 9$ and $2x + y = 18$
4. $2x + 3y = 5$ and $2x + 7y = 10$

8-71. A hawser was originally 70 feet long. After it was cut into two pieces, one piece was 8 feet longer than the other. What are the two equations you must solve to find the lengths of the two pieces?
1. $a + b = 8$ and $a - b = 70$
2. $a + b = 70$ and $a - b = 8$
3. $a + b = 78$ and $a - b = 62$
4. $a + b = 62$ and $a - b = 78$

8-72. A man takes his boat up a river at 8 miles per hour and returns to his starting point at his top speed of 22 miles per hour. If he must complete his trip in 3 hours, about how far up the river can he go?
1. 16 mi
2. 16.7 mi
3. 17 mi
4. 17.6 mi

8-73. When two batteries are connected in series, their combined voltage is 120 volts. If the batteries are wired so that their resulting voltage is equal to the difference between their voltages rather than their sum, the combined voltage is 60 volts. What are the voltages of the two battery units?
1. 20 v and 100 v
2. 30 v and 90 v
3. 40 v and 80 v
4. 50 v and 70 v

8-74. The plot of the inequation $x - y > 5$ is made by first plotting
1. random points
2. many points
3. two points
4. $x - y = 5$

8-75. The plot of the simultaneous solution of $x + y > 5$ and $x - y > 1$ is the overlap of the plot of the individual areas $x + y > 5$ and $x - y > 1$.